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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/741,538

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David A. Petersen

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Siemens Corporation
Intellectual Property Department
170 Wood Avenue South
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EXAMINER

CHENG, JACQUELINE

ART UNIT

PAPER NUMBER

3768

MAIL DATE

DELIVERY MODE

07/09/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/741,538	Applicant(s) PETERSEN ET AL.	
	Examiner JACQUELINE CHENG	Art Unit 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/18/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. **Claim 1** recites the limitation "the plurality, M, of elements" in line 7 of claim 1. There is insufficient antecedent basis for this limitation in the claim. The claim should define M with the original mention of plurality of elements (on line 3 of claim 1). It becomes unclear if the plurality m of elements is a different set of elements than the first mentioned plurality of elements.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1, 2, 6, 16, 20, and 21** are rejected under 35 U.S.C. 102(b) as being anticipated by Leavitt (US 6,491,634 B1). Leavitt discloses a transducer assembly probe which comprises of

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a plurality of transducers, a transmit/receive switch, a plurality of processors, an analog to digital converter, and a sub-beamformer. The transducer assembly is releasably connectable with a portable ultrasound system (element 102) through an interface cable (element 104). The signals returned from the transducers are processed in the transducer assembly probe through the various processors (the front-end ASIC), then converted through an analog to digital converter, and then a portion (a sub-aperture) of the ultrasound signals are forwarded to each sub-beamformer which provides partial beamforming by combining these portions of the input signals into a smaller number of delayed sub-array signals.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 3, 5, 7, 17, and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Leavitt, further in view of Savord (US 6,013,032). Leavitt discloses most of what is claimed as discussed above, but does not explicitly disclose how the sub-beamformer works. It would be obvious to one skilled in the art to use any well known method of sub-beamforming such as disclosed by Savord. Savord discloses sub-beamforming by applying different phase shifts and combining signals. Also although Leavitt does not disclose using a digital to analog converter, depending on the beamformer used, which could be analog or digital, a digital to analog

converter would be needed. It would further the utility of Leavitt to have the digital to analog converter so that the detachable probe can be used with an older ultrasound system which functions in analog signals. Furthermore as Leavitt discloses that it would be apparent that many modifications and variations may be made to the system (col. 10 line 65-col. 11 line 13). So it would therefore be obvious to make a change such as placing the signal processing elements in the detachable connector housing to make the probe head smaller, but still have all the signals pre-processed and simplified before entering the main system such as disclosed in Savord.

8. **Claim 4 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Leavitt, further in view of Fillhart (US Statutory Invention Registration H1171). Leavitt discloses that it would be apparent that many modification and variations may be made to the system (col. 10 line 65-col. 11 line 13) so it would therefore be obvious to make a change such as adding a multiplexer and a demultiplexer to the system such as disclosed by Fillhart.

9. **Claims 9-13, 15, and 22-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Savord in view of either Leavitt or Swayze (US 2002/0081871 A1). Savord discloses an ultrasound system comprising a transducer probe housing that contains an array of transducer elements that define a plurality of subarrays and a subarray processor associated with each of the subarrays. Each subarray signal comprises a sum of weighted component signals. The system also comprises of a cable connected with the ultrasound transducer (fig. 3 element 106) and a connector housing which has a signal processing device in the housing comprising of a phase shift network associated with each of the subarrays for phase shifting and combing the subarray

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signals (col. 2 line 62-col. 3 line 15). What Savord does not disclose is a detachable connector. It would be obvious to one skilled in the art to add a detachable connector in order to be able to switch out different devices with the one system such as disclosed by Swayze, or also it would be obvious to have a detachable connector for portability purposes such as disclosed by Leavitt. Also although Savord does not disclose using a digital to analog converter, depending on the beamformer used, which could be analog or digital, a digital to analog converter would be needed.

10. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Savord in view of , further in view of Fillhart. Leavitt discloses that it would be apparent that many modification and variations may be made to the system (col. 10 line 65-col. 11 line 13) so it would therefore be obvious to make a change such as adding a multiplexer and a demultiplexer to the system such as disclosed by Fillhart.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACQUELINE CHENG whose telephone number is (571)272-5596. The examiner can normally be reached on M-F 10:00-6:30.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian L Casler/
Supervisory Patent Examiner, Art Unit
3737

JC